ABSTRACT OF THE DISCLOSURE

An ionization gauge for isolating an electron source from gas molecules includes the electron source for generating electrons, a collector electrode for collecting ions formed by the impact between the electrons and gas molecules, and an electron window which isolates the electron source from the gas molecules. The ionization gauge can have an anode which defines an anode volume and retains the electrons in a region of the anode. The ionization gauge can have a plurality of electron sources and/or collector electrodes. The collector electrode(s) can be located within the anode volume or outside the anode volume. The ionization gauge can have a mass filter for separating the ions based on mass-to-charge ratio. The ionization gauge can be a Bayard-Alpert type that measures pressure or a residual gas analyzer that determines a gas type.